

Serial No.: 10/678,680
Reply to Office Action of: June 23, 2005
Atty. Docket No.: JJK-0332(P2002J101)

LISTING OF CLAIMS

1.(currently amended) A process for preparing a lubricating oil basestock having a VI of at least about 125 which comprises:

- (a) hydrotreating a lubricating oil feedstock having a wax content of at least about 50 wt.%, based on feedstock, with a hydrotreating catalyst under effective hydrotreating conditions;
- (b) stripping the hydrotreated feedstock to separate gaseous from liquid product;
- (c) contacting a dewaxing catalyst containing an alumina or alumina-containing binder with a stream containing at least from about 100 wppm to 10,000 wppm, measured as oxygen, of at least one oxygenate at a temperature of from 120 to 400°C and a hydrogen pressure of from 791 to 20786 kPa to produce a selectivated dewaxing catalyst; and
- (d) contacting the selectivated dewaxing catalyst from step (c) with the liquid product from step (b) and dewaxing the liquid product under catalytically effective dewaxing conditions.

2. (currently amended) A process for preparing a lubricating oil basestock having a VI of at least about 125 which comprises:

- (a) hydrotreating a lubricating oil feedstock having a wax content of at least about 50 wt.%, based on feedstock, with a hydrotreating catalyst under effective hydrotreating conditions;
- (b) stripping the hydrotreated feedstock to separate gaseous from liquid product;
- (c) adding at least one oxygenate to the liquid product from step (b) to provide a second liquid product containing at least from about 100 wppm oxygen to 10,000 wppm.

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(d) contacting the second liquid product from step (c) with a dewaxing catalyst containing an alumina or alumina-containing binder at a temperature of from 120 to 400°C and a hydrogen pressure of from 791 to 20786 kPa for a time effective to selectivate the dewaxing catalyst; and

(e) contacting the selectivated dewaxing catalyst from step (d) with at least one of the second liquid product from step (c) or the liquid product from step (b) under catalytically effective dewaxing conditions.

3.(original) The process of claims 1 or 2 wherein the hydrotreating catalyst contains at least one Group 6, Group 9 or Group 10 metal.

4. (original) The process of claims 1 or 2 wherein the hydrotreating conditions include a temperature of from 150-400°C, a pressure of from 1480-20786 kPa, a liquid hourly space velocity from 0.1-10 hr⁻¹ and a hydrogen treat rate of 89-1780 m³/m³.

5. (original) The process of claims 1 or 2 wherein the dewaxing catalyst contains at least one molecular sieve containing at least one 10 or 12 ring channel.

6. (original) The process of claim 5 wherein the molecular sieve is at least one of ZSM-5, ZSM-11, ZSM-22, ZSM-23, ZSM-35, ZSM-48, ZSM-57, ferrierite, EU-1, NU-87, SAPO-11, SAPO-41, ITQ-13, MCM-71, zeolite beta, ZSM-12, MCM-68, SAPO-5, SAPO-31, MAPO-36, ZSM-18, offretite, mordenite or faujasite.

7. (original) The process of claim 6 wherein the molecular sieve is ZSM-48.

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8. (original) The process of claims 1 or 2 wherein the oxygenate is at least one alcohol, carboxylic acid, ester, aldehyde, ketone or ether.

9. (original) The process of claim 1 wherein the oxygenate is water.

10. (original) The process of claims 1 or 2 wherein the dewaxing catalyst contains a metal hydrogenation component.

11. (original) The process of claims 1 or 2 wherein the dewaxing catalyst is sulfided, reduced, or sulfided and reduced.

12. (original) The process of claims 1 or 2 wherein dewaxing conditions include a temperature of from 250-400°C, a pressure of from 791-20786 kPa, a liquid hourly space velocity from 0.1-10 hr⁻¹ and a hydrogen treat rate of 45-1780 m³/m³.

13. (original) The process of claims 1 or 2 further comprising a hydrofinishing step.

14. (original) The process of claim 2 wherein the time effective to selectivate the dewaxing catalyst is at least about 1 hour.

15. (original) The process of claim 10 wherein the metal hydrogenation component is at least one of Pt or Pd.

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16. (original) The process of claim 1 wherein the stream is at least one of lubricating oil feedstock or lubricating oil basestock.

17.(currently amended) A process for preparing a lubricating oil basestock having a VI of at least about 125 which comprises:

- (a) hydrotreating a lubricating oil feedstock having a wax content of at least about 50 wt.%, based on feedstock, with a hydrotreating catalyst under effective hydrotreating conditions;
- (b) stripping the hydrotreated feedstock to separate gaseous from liquid product;
- (c) contacting a dewaxing catalyst containing an alumina or alumina-containing binder which contains at least one molecular sieve containing at least one 10 or 12 ring channel with a stream containing at least from about 100 wppm to 10,000 wppm, measured as oxygen, of at least one alcohol, carboxylic acid, ester, aldehyde, ketone or ether at a temperature of from 120 to 400°C and a hydrogen pressure of from 101 to 20786 kPa to produce a selectivated dewaxing catalyst; and
- (d) contacting the selectivated dewaxing catalyst from step (c) with the liquid product from step (b) and dewaxing the liquid product under catalytically effective dewaxing conditions.

18. (currently amended) A process for preparing a lubricating oil basestock having a VI of at least about 125 which comprises:

- (a) hydrotreating a lubricating oil feedstock having a wax content of at least about 50 wt.%, based on feedstock, with a hydrotreating catalyst under effective hydrotreating conditions;

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(b) stripping the hydrotreated feedstock to separate gaseous from liquid product;

(c) adding at least one alcohol, carboxylic acid, ester, aldehyde, ketone or ether to the liquid product from step (b) to provide a second liquid product containing at least from about 100 wppm oxygen to 10,000 wppm;

(d) contacting the second liquid product from step (c) with a dewaxing catalyst containing an alumina or alumina-containing binder which contains at least one molecular sieve containing at least one 10 or 12 ring channel at a temperature of from 120 to 400°C and a hydrogen pressure of from 791 to 20786 kPa for a time effective to selectivate the dewaxing catalyst; and

(e) contacting the selectivated dewaxing catalyst from step (d) with at least one of the second liquid product from step (c) or the liquid product from step (b) under catalytically effective dewaxing conditions.

19. (original) The process of claims 17 or 18 wherein the hydrotreating catalyst contains at least one Group 6, Group 9 or Group 10 metal.

20. (original) The process of claims 17 or 18 wherein the hydrotreating conditions include a temperature of from 150-400°C, a pressure of from 1480-20786 kPa, a liquid hourly space velocity from 0.1-10 hr⁻¹ and a hydrogen treat rate of 89-1780 m³/m³.

21. (original) The process of claim 17 or 18 wherein the dewaxing catalyst is at least one of ZSM-5, ZSM-11, ZSM-22, ZSM-23, ZSM-35, ZSM-48, ZSM-57, ferrierite, EU-1, NU-87, SAPO-11, SAPO-41, ITQ-13, MCM-71, zeolite beta, ZSM-12, MCM-68, SAPO-5, SAPO-31, MAPO-36, ZSM-18, offretite, mordenite or faujasite.

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22. (original) The process of claim 21 wherein the molecular sieve is ZSM-48.

23. (original) The process of claim 17 or 18 wherein the dewaxing catalyst contains a metal hydrogenation component.

24. (original) The process of claims 17 or 18 wherein the dewaxing catalyst is sulfided, reduced, or sulfided and reduced.

25. (original) The process of claims 17 or 18 wherein dewaxing conditions include a temperature of from 250-400°C, a pressure of from 791-20786 kPa, a liquid hourly space velocity from 0.1-10 hr⁻¹ and a hydrogen treat rate of 45-1780 m³/m³.

26. (original) The process of claims 17 or 18 further comprising a hydrofinishing step.

27. (original) The process of claim 18 wherein the time effective to selectivate the dewaxing catalyst is at least about 1 hour.

28. (original) The process of claim 17 wherein the stream is at least one of lubricating oil feedstock or lubricating oil basestock.

29. (original) The process of claim 23 wherein the metal hydrogenation is at least one of Pt or Pd.

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30. (currently amended) A process for preparing a lubricating oil basestock having a VI of at least about 125 which comprises:

- (a) hydrotreating a lubricating oil feedstock having a wax content of at least about 50 wt.%, based on feedstock, with a hydrotreating catalyst under effective hydrotreating conditions;
- (b) stripping the hydrotreated feedstock to separate gaseous from liquid product;
- (c) contacting a dewaxing catalyst containing an alumina or alumina-containing binder which contains at least one molecular sieve containing at least one 10 or 12 ring channel with a stream containing at least from about 100 wppm to 10,000 wppm, measured as oxygen, of at least one alcohol, carboxylic acid, ester, aldehyde, ketone or ether at a temperature of from 120 to 400°C and a hydrogen pressure of from 101 to 20786 kPa to produce a selectivated dewaxing catalyst;
- (d) contacting the selectivated dewaxing catalyst from step (c) with the liquid product from step (b) and dewaxing the liquid product under catalytically effective dewaxing conditions; and.
- (e) hydrofinishing the dewaxed product from step (d) with a hydrofinishing catalyst under effective hydrofinishing conditions.

31.(currently amended) A process for preparing a lubricating oil basestock having a VI of at least about 125 which comprises:

- (a) hydrotreating a lubricating oil feedstock having a wax content of at least about 50 wt.%, based on feedstock, with a hydrotreating catalyst under effective hydrotreating conditions;
- (b) stripping the hydrotreated feedstock to separate gaseous from liquid product;

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(c) adding at least one alcohol, carboxylic acid, ester, aldehyde, ketone or ether to the liquid product from step (b) to provide a second liquid product containing at least from about 100 wppm oxygen to 10,000 wppm;

(d) contacting the second liquid product from step (c) with a dewaxing catalyst containing an alumina or alumina-containing binder which contains at least one molecular sieve containing at least one 10 or 12 ring channel at a temperature of from 120 to 400°C and a hydrogen pressure of from 791 to 20786 kPa for a time effective to selectivate the dewaxing catalyst;

(e) contacting the selectivated dewaxing catalyst from step (d) with at least one of the second liquid product from step (c) or the liquid product from step (b) under catalytically effective dewaxing conditions; and

(f) hydrofinishing the dewaxed product from step (e) with a hydrofinishing catalyst under effective hydrofinishing conditions.

32. (original) The process of claims 30 or 31 wherein the hydrotreating catalyst contains at least one Group 6, Group 9 or Group 10 metal.

33. (original) The process of claims 30 or 31 wherein the hydrotreating conditions include a temperature of from 150-400°C, a pressure of from 1480-20786 kPa, a liquid hourly space velocity from 0.1-10 hr⁻¹ and a hydrogen treat rate of 89-1780 m³/m³.

34. (original) The process of claim s 30 or 31 wherein the molecular sieve is at least one of ZSM-5, ZSM-11, ZSM-22, ZSM-23, ZSM-35, ZSM-48, ZSM-57, ferrierite, EU-1, NU-87, SAPO-11, SAPO-41, ITQ-13, MCM-71, zeolite beta, ZSM-12, MCM-68, SAPO-5, SAPO-31, MAPO-36, ZSM-18, offretite, mordenite or faujasite.

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35. (original) The process of claim 34 wherein the molecular sieve is ZSM-48.

36. (original) The process of claims 30 or 31 wherein the dewaxing catalyst contains a metal hydrogenation component.

37. (original) The process of claims 30 or 31 wherein the dewaxing catalyst is sulfided, reduced, or sulfided and reduced.

38. (original) The process of claim 30 or 31 wherein dewaxing conditions include a temperature of from 250-400°C, a pressure of from 791-20786 kPa, a liquid hourly space velocity from 0.1-10 hr⁻¹ and a hydrogen treat rate of 45-1780 m³/m³.

39. (original) The process of claims 30 or 31 wherein the hydrofinishing catalyst is at least one of M41S family of catalysts.

40. (original) The process of claims 30 or 31 wherein hydrofinishing conditions include a temperature of from 150-350°C, a pressure of from 2889-20786 kPa, a liquid hourly space velocity from 0.1-5 hr⁻¹ and a hydrogen treat rate of 45-1780 m³/m³.

41. (original) The process of claim 31 wherein the time effective to selectivate the dewaxing catalyst is at least about 1 hour.

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42. (original) The process of claim 30 wherein the stream is at least one of lubricating oil feedstock or lubricating oil basestock.

43. (original) The process of claim 36 wherein the metal hydrogenation component is at least one of Pt or Pd.

44. (currently amended) A process for preparing a lubricating oil basestock having a VI of at least about 125 which comprises:

(a) hydrotreating a lubricating oil feedstock having a wax content of at least about 50 wt.%, based on feedstock, with a hydrotreating catalyst under effective hydrotreating conditions;

(b) stripping the hydrotreated feedstock to separate gaseous from liquid product;

(c) contacting a dewaxing catalyst containing an alumina or alumina-containing binder which contains ZSM-48 and a metal hydrogenation component which contains at least one of Pt or Pd with a stream containing at least from about 100 wppm to 10,000 wppm, measured as oxygen, of at least one alcohol, carboxylic acid, ester, aldehyde, ketone or ether at a temperature of from 120 to 400°C and a hydrogen pressure of from 101 to 20786 kPa to produce a selectivated dewaxing catalyst;

(d) contacting the selectivated dewaxing catalyst from step (c) with the liquid product from step (b) and dewaxing the liquid product under catalytically effective dewaxing conditions; and.

(e) hydrofinishing the dewaxed product from step (d) with a mesoporous hydrofinishing catalyst from the M41S family under effective hydrofinishing conditions.

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45. (currently amended) A process for preparing a lubricating oil basestock having a VI of at least about 125 which comprises:

- (a) hydrotreating a lubricating oil feedstock having a wax content of at least about 50 wt.%, based on feedstock, with a hydrotreating catalyst under effective hydrotreating conditions;
- (b) stripping the hydrotreated feedstock to separate gaseous from liquid product;
- (c) adding at least one alcohol, carboxylic acid, ester, aldehyde, ketone or ether to the liquid product from step (b) to provide a second liquid product containing at least from about 100 wppm oxygen to 10,000 wppm;
- (d) contacting the second liquid product from step (c) with a dewaxing catalyst containing an alumina or alumina-containing binder which contains ZSM-48 and a metal hydrogenation component which contains at least one of Pt or Pd at a temperature of from 120 to 400°C and a hydrogen pressure of from 791 to 20786 kPa for a time effective to selectivate the dewaxing catalyst;
- (e) contacting the selectivated dewaxing catalyst from step (d) with at least one of the second liquid product from step (c) or the liquid product from step (b) under catalytically effective dewaxing conditions; and
- (f) hydrofinishing the dewaxed product from step (e) with a hydrofinishing catalyst from the M41S family under effective hydrofinishing conditions.

46. (original) The process of claims 44 or 45 wherein the hydrotreating catalyst contains at least one Group 6, Group 9 or Group 10 metal.

47. (original) The process of claims 44 or 45 wherein the hydrotreating conditions include a temperature of from 150-400°C, a pressure of from 1480-

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20786 kPa, a liquid hourly space velocity from $0.1-10 \text{ hr}^{-1}$ and a hydrogen treat rate of $89-1780 \text{ m}^3/\text{m}^3$.

48. (original) The process of claims 44 or 45 wherein the dewaxing catalyst is sulfided, reduced, or sulfided and reduced.

49. (original) The process of claim 44 or 45 wherein dewaxing conditions include a temperature of from $250-400^\circ\text{C}$, a pressure of from 791-20786 kPa, a liquid hourly space velocity from $0.1-10 \text{ hr}^{-1}$ and a hydrogen treat rate of $45-1780 \text{ m}^3/\text{m}^3$.

50. (original) The process of claims 44 or 45 wherein hydrofinishing conditions include a temperature of from $150-350^\circ\text{C}$, a pressure of from 2889-20786 kPa, a liquid hourly space velocity from $0.1-5 \text{ hr}^{-1}$ and a hydrogen treat rate of $45-1780 \text{ m}^3/\text{m}^3$.

51. (original) The process of claim 45 wherein the time effective to selectivate the dewaxing catalyst is at least about 1 hour.

52. (original) The process of claim 44 wherein the stream is at least one of lubricating oil feedstock or lubricating oil basestock.

53. (currently amended) A process for preparing a lubricating oil basestock having a VI of at least about 125 which comprises:

(a) hydrotreating a lubricating oil feedstock having a wax content of at least about 50 wt.%, based on feedstock, with a hydrotreating catalyst under effective hydrotreating conditions;

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(b) stripping the hydrotreated feedstock to separate gaseous from liquid product;

(c) contacting a dewaxing catalyst containing an alumina or alumina-containing binder which contains at least one molecular sieve containing at least one 10 or 12 ring channel with a stream containing at least from about 100 wppm to 10,000 wppm, measured as oxygen, of water at a temperature of from 120 to 400°C and a hydrogen pressure of from 101 to 20786 kPa to produce a selectivated dewaxing catalyst; and

(d) contacting the selectivated dewaxing catalyst from step (c) with the liquid product from step (b) and dewaxing the liquid product under catalytically effective dewaxing conditions.

54.(currently amended) A process for preparing a lubricating oil basestock having a VI of at least about 125 which comprises:

(a) hydrotreating a lubricating oil feedstock having a wax content of at least about 50 wt.%, based on feedstock, with a hydrotreating catalyst under effective hydrotreating conditions;

(b) stripping the hydrotreated feedstock to separate gaseous from liquid product;

(c) adding water to the liquid product from step (b) to provide a second liquid product containing at least from about 100 wppm oxygen to 10,000 wppm;

(d) contacting the second liquid product from step (c) with a dewaxing catalyst containing an alumina or alumina-containing binder which contains at least one molecular sieve containing at least one 10 or 12 ring channel at a temperature of from 120 to 400°C and a hydrogen pressure of from 791 to 20786 kPa for a time effective to selectivate the dewaxing catalyst; and

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(e) contacting the selectivated dewaxing catalyst from step (d) with at least one of the second liquid product from step (c) or the liquid product from step (b) under catalytically effective dewaxing conditions.

55. (original) A lubricating oil base stock prepared by the process of claims 1 or 2, said base stock having a VI from 145 to 155, a viscosity at 100°C of from 3.0 to 4.3 cSt and a pour point of from -15 to -40 °C.

56. (original) The base stock of claim 55 having a viscosity of from 3.0 to 3.6.